

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference P001792PC	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/EP2004/001115	International filing date (<i>day/month/year</i>) 06.02.2004	Priority date (<i>day/month/year</i>) 06.02.2004
International Patent Classification (IPC) or both national classification and IPC INV. H04Q7/38 H04L12/28		
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1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.



2. This REPORT consists of a total of 9 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 5 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 02.12.2005	Date of completion of this report 11.05.2006
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EXAMINATION REPORT**

International application No. **PCT/EP2004/001115**

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-19 as originally filed

Claims, Numbers

1-17 received on 02.12.2005 with letter of 02.12.2005

Drawings, Sheets

1/3-3/3 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

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5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-17
	No: Claims	
Inventive step (IS)	Yes: Claims	1-17
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-17
	No: Claims	

2. Citations and explanations

see separate sheet

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A. Concerning point V:

1. The remarks herein below are done based on a set of claims which fulfills the conditions stated in Article 6 PCT (see clarity objections made in this respect on the claims in paragraph B below).
2. The present application relates to an **access network**, a **mobile telecommunication network**, and a **method** according to the features of respective independent **claims 1, 8 and 15**.
3. **Generally**, when a mobile terminal is moving between a licensed mobile network (e.g. a GSM or UMTS network), and an unlicensed network (e.g. DECT, WLAN, Bluetooth, etc.) different mechanisms are implemented to provide a continuous connectivity to the user, i.e. by implementing a handover procedure between the licensed and the unlicensed network.

Document **EP-A-1 207 708** discloses a mobile terminal which has means to connect to a licensed mobile network and to an unlicensed network, wherein the unlicensed network comprises a home base station controller (HBSC) to which a plurality of home base transceiver stations (HBSs) are connected, and which assigns to all said HBSs a "unique code" (i.e. they are assigned the same location area). The location area identification is used for updating the location of a mobile terminal moving from the licensed to the unlicensed network.

Document **EP-A-1 271 852** discloses the assignment of a common identity to a plurality of access points controlled by a control unit when a mobile terminal is moving from one access point to another (handover between access points in the same network), in order for the mobile terminal to remain unaware of the physical identity of the access point by which said mobile terminal is currently served, and at the same time maintain the same frequency hopping pattern without interruption.

Document **WO 03/079706 A1** discloses an intersystem handover procedure between a licensed and an unlicensed network, wherein the unlicensed network comprises a gateway access point, connected to the rest of access points, which identity is used to identify in which network is currently a mobile terminal which moves between the

licensed and the unlicensed network.

Document **WO 99/01002 A2** discloses a handover procedure, wherein a handover reference signal is generated when a random access burst is transmitted during handover.

4. A **problem** arises when a handover is necessary from a licensed to an unlicensed network in order to properly identify a HBS connected to a HBSC of said unlicensed network which will be involved in a handover from said licensed to said unlicensed network, when all the HBSs connected to said HBSC are assigned the same identifier.
5. According to the **special technical features of the invention**, a common identifier allocated to all local base stations (HBSs) connected to an access network controller (HBSC) of an unlicensed network is, at least in part, sent by each local base station to a mobile station located within an associated mini-cell of a local base station; said access network controller reserves the necessary local resources, generates a handover reference and transmits said handover reference in a handover acknowledgement message to the core network portion of a licensed mobile network currently serving the mobile terminal when a handover request message containing said common identifier is received from the core network portion of said licensed mobile network; said access network controller receives a message from said mobile station including said handover reference via a local base station and sets up a communication path with said local base station.
6. The present invention provides the **technical effect** of optimally establishing a communication path between a mobile station and a local base station connected to an access point controller of an unlicensed network, when a mobile terminal is handed over from a licensed to an unlicensed network and all the local base stations of the unlicensed network (connected to the same access point controller) are assigned the same identifier.
7. The special technical features corresponding to an access network, a mobile communication network and a method of the present invention are neither disclosed in, nor rendered obvious from the disclosure of any of the other **prior art documents**

cited in the Search Report, either alone or in combination, and the solution given by the present application to the problem posed is considered **not obvious** for a skilled person.

8. Thus, the subject-matter of claims 1-17 meet the requirements of Article 33(2) and (3) PCT regarding of novelty and inventive step.
9. The present application is susceptible of industrial application, Article 33(4) PCT.

B. Additional remarks concerning the clarity of the claims (Article 6 PCT):

10. The feature "an access network" of claim 1, and the feature "a mobile telecommunications network including ... at least **one first access network...**" of claim 8 are unclear (Article 6 PCT), since **the scope of said claims is broader than justified** by the description and drawings (see PCT Guidelines 5.43). In particular, regarding claim 1, "an access network" should be an "**an unlicensed-radio access network**", and, regarding claim 8, "the first access network" should be a "**public licensed mobile network**" as specified in the description (see e.g. page 1, lines 5-8 of the application as filed), since no alternatives are envisaged (see PCT Guidelines 5.56).
11. It should be noted that features relating to activities in which the use of a physical entity is implied (i.e. doing something by means of), are regarded as features of a **process**. On the other hand, functional features used to define physical entities (e.g. "means for ..."), as in the present case, are interpreted as features of a **system/apparatus** (PCT Guidelines 5.12).

However, some of the features of claims 1 and 8 are defined as features relating to activities in which the use of a physical entity is implied (i.e. "... all said mini-cells are assigned a common identifier..."). This leads to **doubts as to the category of these claims**, resulting in lack of clarity on the subject-matter for which protection is sought (PCT Guidelines 5.02).

12. Moreover, the various definitions of the network given in independent **claims 1 and 8** are such that the claims as a whole are **not concise**, contrary to Article 6 PCT (see also Rule 6.1(a) PCT; PCT Guidelines, 5.42). Moreover, **lack of clarity** of the claims as a whole arises, since the plurality of independent claims makes it difficult, if not impossible, to determine the matter for which protection is sought, and places and undue burden on others seeking to establish the extent of the protection.

In the present case it is considered appropriate to have **only one** independent claim for a network.

13. Furthermore, a **consistent terminology** throughout the claims is required for clarity reasons (Article 6 PCT) when referring to the same technical features (Rule 10.2 PCT and Guidelines 4.22). In this respect, a single, uniform expression should be employed when denoting the same technical features. In addition, **corresponding claims** like claims 8 and 15 (and claims 1 and 15) **must contain the same or corresponding special technical features and be terminologically consistent** between them (Guidelines 10.01).

Nevertheless, on the one hand, some of the features defined in claim 8 have **no corresponding technical features** in claim 15, and vice versa, and, on the other hand, the **terminology** used for the definition of corresponding technical features existing is **not always consistent**.

- 13.1 In particular, the following features of claims 8 and 15 cannot be considered as "corresponding technical features" since its technical meaning and effect is different:
- The feature "a mobile communications network" of claim 8 and the feature "a method for handing over a communication with a mobile station from a cell of a public licensed mobile network to a mini-cell of an unlicensed-radio access network connected to said public mobile network" of claim 15;
 - The feature "one first access network portion" of claim 8, and the feature "a public licensed mobile network" of claim 15;

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- The feature "an access network controller adapted to communicate with said core network portion over a predetermined licensed mobile network interface" of claim 8 and "an access network controller adapted to communicate ... with the core network portion of said public mobile network" of claim 15;

- The feature "all said mini-cells are assigned a common identifier associated with said access network controller" of claim 8 and the feature "allocating a common identifier to all local base stations connected to said access network controller" of claim 15;

- The feature "said access network controller is adapted to respond to a handover request from said core network by assigning a handover reference to said request" of claim 8 and the feature "said access network controller responding to a handover request message containing said common identifier received from the core network portion by generating a handover reference" of claim 15;

- The feature "to setup a communication path between a mobile station and said core network when a message containing said handover reference is received from said mobile station" of claim 8 and the feature "setting up a communication path over said fixed broadband network with said local base station in response to said received handover reference" of claim 15.

13.2 In addition, claim 8 does not comprise in its subject-matter corresponding technical features to the following ones of claim 15:

- "said public licensed mobile network comprising an access portion including a base station defining said cell and a core network portion including a switching control part connected to said base station";

- "each local base station communicating at least a part of said common identifier to a mobile station located within the associated mini-cell via said unlicensed-radio interface";

- "and transmitting said handover reference as a handover acknowledgment message to said core network portion".

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13.3 Moreover, claim 15 does not comprise in its subject-matter corresponding technical features for the following ones of claim 8:

- "said at least one first access network is adapted to address a handover request containing said common identifier via said core network to said access network controller when handover of a communication with said mobile terminal to said second (unlicensed-radio) access network is required";
- "wherein said *at least* first and second access network portions are adapted to communicate with a mobile terminal and said core network portion".

13.4 Similar objections to the ones of claim 8 apply also to claim 1 (see paragraphs 13.1-13.3 above).

14. Therefore, in view of the above objections on paragraph 13, claims 1, 8 and 15 **are not linked by the same or corresponding special technical features**, as required by Rules 13.1 and 13.2 PCT.

15. The reference sign "unlicensed-radio interface (31)" in claims 1 and 8 appears to be incorrect (Article 6 PCT).

General Remarks:

16. In case of submitting amendments (e.g. in the PCT Chapter II or Regional Phase), the following remarks should be taken into account:

16.1 The **opening part** of the description is **not in agreement** with the independent claims, Rule 5.1(a)(iii) PCT.

16.2 The description comprises in lines 6-7 of page 3 a reference to a document which is **"incorporated by reference"**.

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Claims:

- 5 1. An access network adapted to communicate with a mobile terminal and a core network portion (20) of a mobile telecommunications network, said access network comprising:
- 10 a plurality of local base stations (301) each defining a mini-cell and adapted to communicate with mobile terminals (1) located in a respective mini-cell over an unlicensed-radio interface (31);
- an access network controller (303) adapted to communicate with said core network portion over a predetermined licensed mobile network interface and connected to said plurality of local base stations (301);
- characterised in that
- 15 all said mini-cells are assigned a common identifier associated with said access network controller and in that
- said access network controller (303) is adapted to receive a handover request containing said common identifier from said core network (20),
- 20 to respond to said handover request by assigning a handover reference to said request and to setup a communication path between a mobile station and said core network when a message containing said handover reference is received from said mobile station.
- 25 2. An access network as claimed in claim 1, characterised in that said local base stations are adapted to communicate said common identifier to said mobile terminal.
3. An access network as claimed in any previous claim, characterised in that said common identifier identifies a single cell address.

4. An access network as claimed in any previous claim, characterised in that said common identifier identifies a channel frequency utilised by said local base stations.
- 5
5. An access network as claimed in any previous claim, characterised in that said common identifier identifies a base station address common to all local base stations.
- 10
6. An access network as claimed in any previous claim, characterised in that said common identifier is known to said core network.
7. An access network as claimed in any previous claim, further characterised by a fixed broadband network (302) connecting said plurality of local base stations (301) with said access network controller (303).
- 15
8. A mobile telecommunications network including a core network portion (20), at least one first access network portion (10), and at least one second unlicensed radio access network portion (30), wherein said first and second access network portions are adapted to communicate with a mobile terminal (1) and said core network portion (20), said at least one second access network portion comprising:
- 20
- a plurality of local base stations (301) each defining a mini-cell and adapted to communicate with mobile terminals (1) located in a respective mini-cell over an unlicensed-radio interface (31);
- 25
- an access network controller (303) adapted to communicate with said core network portion over a predetermined licensed mobile network interface and connected with said plurality of local base stations (301), characterised in that
- 30
- all said mini-cells are assigned a common identifier associated with said

access network controller,

said at least one first access network (10) is adapted to address a handover request containing said common identifier via said core network (20) to said access network controller (303) when handover of a communication with said mobile terminal to said second access network is required, said access network controller (303) is adapted to respond to a handover request from said core network (20) by assigning a handover reference to said request and to setup a communication path between a mobile station and said core network when a message containing said handover reference is received from said mobile station.

9. A network as claimed in claim 8, characterised in that said local base stations are adapted to broadcast said common identifier within an associated mini-cell.

10. A network as claimed in claim 8 or 9, characterised in that said common identifier identifies a single cell address.

11. A network as claimed in any one of claims 8 to 10, characterised in that said common identifier identifies a channel frequency utilised by said local base stations.

12. A network as claimed in any one of claims 8 to 11, characterised in that said common identifier identifies a base station address common to all local base stations.

13. A network as claimed in any one of claims 8 to 12, characterised in that said common identifier is known to said at least one first access network portion (10).

14. A network as claimed in any one of claims 8 to 13, characterised by
a fixed broadband network (302) connecting said plurality of local base
stations (301) with said access network controller (303).

5 15. A method for handing over a communication with a mobile station from a
cell of a public licensed mobile network to a mini-cell of an unlicensed-
radio access network connected to said public mobile network, said public
licensed mobile network comprising an access portion including a base
station (10) defining said cell and a core network portion including a
10 switching control part (202) connected to said base station, said
unlicensed-radio access network (30) comprising a plurality of local base
stations (301) each defining a mini-cell and adapted to communicate with a
mobile station (1) via an unlicensed-radio interface and an access network
controller (303) adapted to communicate with said local base stations and
15 with the core network portion of said public mobile network, said method
including:
allocating a common identifier to all local base stations connected to said
access network controller,
each local base station communicating at least a part of said common
20 identifier to a mobile station (1) located within the associated mini-cell via
said unlicensed-radio interface,
said access network controller (303) responding to a handover request
message containing said common identifier received from the core network
portion by generating a handover reference and transmitting said handover
25 reference as a handover acknowledgment message to said core network
portion (10),
said access network controller (303) receiving said handover reference
from said mobile station via said local base station (301) and setting up a
communication path over said fixed broadband network with said local
30 base station in response to said received handover reference.

16. A method as claimed in claim 15 further characterised by the steps of:
said base station (10) of said public licensed mobile network receiving said
common identifier from said mobile station, identifying said access
5 network controller (303) using said common identifier and generating a
handover request message addressed to said access network controller
(303) via said switching control part (202).

17. A method as claimed in claim 15 or 16, further characterised by the steps
10 of: said mobile station (1) upon receipt of said common identifier
transmitting a report to said base station (10) adapted to trigger handover
irrespective of other frequencies received by said mobile station.

15